

### **REMARKS – General**

By the above amendment, Applicants have amended the title to emphasize that the primary purpose of the invention is to measure dry density of soils.

The applicants have removed all mention of the measurement of moisture content of soil as being a function of this invention.

The applicants have also re-written the claims to better define the invention related to prior art, as well as to overcome the technical rejections.

The applicants have re-written the Abstract so it is one paragraph, and better explains the operation of the invention.

#### **The Rejection of Claim 1 on Christy is Overcome**

The applicants agree with the Examiner as relates to the wealth of prior art in the field of moisture measurement, and have re-written the scope of the invention and claims to exclude the function of moisture measurement. The applicants respectfully disagree with Examiner related to Christy teaching moisture measurement. In fact, Christy teaches the measurement of soil conductivity as relates to soil grain size for agricultural purposes. It is not likely that Christy would turn up in a search of prior art related to measurement of dry density of soil.

#### **The Rejection of Claim 1 on Pullman is Overcome**

Pullman teaches moisture measurement only in tobacco, by use of the in-phase component of current passing through the test sample, thus producing the real resistance of the sample. Although his drawings show a parallel resistance and capacitance, he makes no claim for any determination of the value of the parallel capacitance. Applicants have tested a wide variety of soils, and found that the large variation of salt content and grain sizes make a simple resistance measurement inadequate for proper determination of soil dry density. It is not likely that Pullman would turn up in a search of prior art related to measurement of dry density of soil, and thus, the connection of Christy and Pullman would not have been likely to the applicants.

#### **The Rejection of Claim 1 on Campbell is Overcome**

Campbell relates only to moisture measurement of soil, and not soil dry density. It is not likely that Campbell would turn up in a search of prior art related to measurement of dry density of soil, and thus, the connection of Christy and Campbell would not have been likely to the applicants.

There is no justification, in Christy or Pullman or Campbell, or in any other prior art separate from the applicant's disclosure, which suggests that these references be combined, much less be combined in the manner proposed.

With regard to the proposed combination of Christy, Pullman, and/or Campbell, it is well known that in order for any prior-art references themselves to be validly combined for use in a prior-art § 103 rejection, *the references themselves* (or some other prior art) **must** suggest that they be combined. E.G., as was stated in In re Sernaker, 217 U.S.P.Q. 1, 6 (C.S.F.C. 1983):

“[P]rior art references in combination do not make an invention obvious unless something in the prior art references would suggest the advantage to be derived from combining their teachings.”

### **Comments on Other Prior Art**

With regard to the citation of prior art by Anderson, et al., US 6,380,745, Konig, et al., US 3,769,581, and Matlin, US 3,882,383, none of these inventions teach the measurement of soil capacitance (dielectric constant) to be used for the determination of either soil moisture content or soil density. When researching the EDG principles, the applicants found that for accurate determination of dry density, it is necessary to determine both the equivalent parallel soil resistance and equivalent parallel soil capacitance, and combine and correlate these in the new and novel methods described in this application.

### **New and Novel Features of the Invention**

The Examiner is respectfully reminded that prior art does not teach the use of the two correlating factors that make this invention new and novel. First, the quotient of measured soil capacitance and measured soil resistance is correlated with the physical unit weight of water of the soil, and second; the real impedance of the soil is correlated with the physical wet density of the soil. These novel correlation factors produce new and unexpected results, and hence are unobvious and patentable over these references and other references that employ simple capacitance or resistance only to measure soil properties.

### **Conclusion**

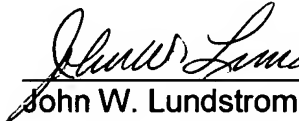
For all the above reasons, applicants submit that the specification and claims are now in proper form, and that the claims all define patentably over the prior art. Therefore they submit that this application is now in condition for allowance, which action they respectfully solicit.

### **Conditional Request for Constructive Assistance**

Applicants have amended the specification and claims of this application so they are proper, definite, and define novel structure which is also unobvious. If, for any reason, this application is not believed to be in full condition for allowance,

applicants respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. § 706.03(d) and § 707.07 (j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.


Very respectfully,

  
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